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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.              | CONFIRMATION NO. |
|---|-------------|----------------------|----------------------------------|------------------|
| 10/532,717  | 09/29/2005  | Toshiko Yokota       | 3209-104                         | 8743             |
| 6449 7590 02/07/2007<br>ROTHWELL, FIGG, ERNST & MANBECK, P.C.<br>1425 K STREET, N.W.<br>SUITE 800<br>WASHINGTON, DC 20005 |             |                      | EXAMINER<br>LAM, CATHY FONG FONG |                  |
|   |             |                      | ART UNIT                         | PAPER NUMBER     |
|   |             |                      | 1775                             |                  |

| SHORTENED STATUTORY PERIOD OF RESPONSE | NOTIFICATION DATE | DELIVERY MODE |
|--|-------------------|---------------|
| 3 MONTHS                               | 02/07/2007        | ELECTRONIC    |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 02/07/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

**Office Action Summary**

Application No.

10/532,717

Applicant(s)

YOKOTA ET AL.

Examiner

Cathy Lam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 26-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,6 and 8-25 is/are rejected.
- 7) ☒ Claim(s) 2,3,5 and 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Election/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-25, drawn to a copper foil with a dielectric layer.

Group II, claim(s) 26-31, drawn to a method of making a copper foil with a dielectric layer.

1. The inventions listed as Groups I & II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: group I is directed to a product with a copper foil adhered to a dielectric surface via metallic bonding material, and a polyimide with dielectric filler are first filled the pores on the dielectric surface before the metallic bonding material is applied. some method claim (i.e. claim 30) however is directed to characteristics of the dielectric fillers in the polyimide.

2. During a telephone conversation with Atty: Robert Murray on January 22, 2007 a provisional election was made with traverse to prosecute the invention of I, claims 1-25.

Affirmation of this election must be made by applicant in replying to this Office action.

Claims 26-31 are withdrawn from further consideration by the examiner, 37

CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Information Disclosure Statement***

4. The information disclosure statement filed on April 27, 2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Applicant is required to submit a copy of the following 4 references: 2001-185649, 03-16110, 11-97289, and 2002-367856.

***Claim Rejections - 35 USC § 112***

5. Claims 1 and dependents rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is vague and indefinite, as to which layer (i.e. the inorganic oxide sputter film or the copper foil) has a thickness of 1.0  $\mu\text{m}$  or less?

Claims 1 and its independents, it is structurally indefinite, as to how the polyimide resin is in relationship with the binder metal layer, the high melting point metal layer, the copper foil and the lower and upper electrodes? Clarification is required.

In claims 2, 3, 5, 7, etc. applicant is required to clarify whether "an inorganic-oxide sputter film" (as in claim 2), "polyimide resin" (as in claim 3), "a binder metal layer" (as in claim 5), and "a high-melting metal layer" (as in claim 7), are referring to the previously mentioned inorganic-oxide sputter film (as in claim 1), polyimide film (as in claim 1), binder metal layer (as in claim 4) and high-melting metal layer (as in claim 6).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 4, 6, 8-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayakawa et al (US 5685968).

Hayakawa discloses a ceramic substrate (1) with a thin film capacitor. The capacitor is formed onto the ceramic substrate through a connecting layer (2). A lower electrode base layer (3), a Ta<sub>2</sub>N film (4), a TaON dielectric layer (6a), an anodic oxidize layer (6b) and an upper electrode connecting layer (7) and an upper electrode (8a1) (Fig. 7).

The connecting layer (2) is comprised of Ti and Cu, and the lower electrode base layer (3) is comprised Cu and Ni (col 5 L 44-45 & L 53-54). The Ta<sub>2</sub>N film (4) and the TaON film (6a), both of which the examiner is taking the position that they are analogous to the claimed dielectric layer, has a thickness of 0.15 µm and 0.3-0.5 µm, respectively; wherein the combined thickness is less than 1 µm (col 6 L 3-4 & L 15-16).

Hayakawa discloses that the dielectric Ta<sub>2</sub>N film (4) has surface defects but the electrode base layer (3) fill up all the surface defects (col 5 L 63-65). Another dielectric layer (6a) (or TaON) is formed onto the Ta<sub>2</sub>N film (4) (col 6 L 14-17). The surface of the dielectric layer (i.e. TaON) (6a) is coated with an upper electrode connecting layer (7) of

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Ti-Cu material (col 6 L 43-45). Then, an upper electrode (8a1) made of copper, nickel and gold, is formed onto the Ti-Cu connecting layer (7) (Fig. 8).

The examiner is taking the position that the Ti-Cu connecting layer (7) and the lower electrode base layer (3) are analogous to the claimed binder metal layer and the high melting point metal layer because the metals (i.e. Cu, Ni, Ti) chosen for these layers meet the claimed material (i.e. claims 5 & 7).

The prior art is silent about using a polyimide resin to fill the surface defects of the dielectric layer. In view of the prior art teaching, one skill in the art would choose polyimide to fill the surface voids because polyimide is heat resistive and easily applicable, and it is widely used in the electronic field.

***Allowable Subject Matter***


8. Claims 2, 3, 5 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if incorporate all the limitations into independent claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Cathy Lam  
Primary Examiner  
Art Unit 1775

cfl  
January 25, 2007